NRC Form 366
(9-83)

U.S. NUCLEAR REGULATORY COMMISSION
APPROVED OMB NO. 3150-0104
EXPIRES: 8/31/85

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1)	DOCKET NUMBER (2)	PAGE (3)
Fort Calhoun Station, Unit No. 1	0 5 0 0 0 2 8 5	1 OF 0 2

TITLE (4)
Low Boron Concentration in Safety Injection and Refueling Water Tank

EVENT DATE (5)			LER NUMBER (6)			REPORT DATE (7)			OTHER FACILITIES INVOLVED (8)	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	MONTH	DAY	YEAR	FACILITY NAMES	DOCKET NUMBER(S)
1 0	1 7	8 4	8 4	0 2 1	0 0				N	0 5 0 0 0
										0 5 0 0 0

OPERATING MODE (9)	1	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following) (11)			
POWER LEVEL (10)	1 0 0	20.402(b)	20.405(c)	50.73(a)(2)(iv)	73.71(b)
		20.405(a)(1)(i)	50.36(c)(1)	50.73(a)(2)(v)	73.71(c)
		20.405(a)(1)(ii)	X 50.36(c)(2)	50.73(a)(2)(vii)	OTHER (Specify in Abstract below and in Text, NRC Form 366A)
		20.405(a)(1)(iii)	50.73(a)(2)(i)	50.73(a)(2)(viii)(A)	
		20.405(a)(1)(iv)	50.73(a)(2)(ii)	50.73(a)(2)(viii)(B)	
		20.405(a)(1)(v)	50.73(a)(2)(iii)	50.73(a)(2)(x)	

LICENSEE CONTACT FOR THIS LER (12)

NAME	TELEPHONE NUMBER
J. J. Fluehr, Reactor Engineer Fort Calhoun Station, Unit No. 1	AREA CODE 4 0 2 — 4 2 6 - 4 0 1 1

COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS		CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS	

SUPPLEMENTAL REPORT EXPECTED (14)

		EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR
YES (If yes, complete EXPECTED SUBMISSION DATE)	X NO				

ABSTRACT (Limit to 1400 spaces, i.e., approximately fifteen single-space typewritten lines) (16)

Technical Specification 2.3(1)a requires that the safety injection and refueling water tank (SIRWT) contain water with a boron concentration of at least 1700 ppm. A routine sample was drawn at 0100 on October 17, 1984; the analysis of the sample yielded a boron concentration of 1668 ppm. The control room was notified at 0120 and boration of the SIRWT was initiated. A second sample was drawn at 0315 following the addition of 1500 gallons of 6.74% boric acid. The analysis of this sample yielded a boron concentration of 1997 ppm. After continued recirculation of the SIRWT, a sample drawn at 0500 yielded a boron concentration of 1867 ppm. The SIRWT boron concentration will be maintained at a level higher than 1700 ppm to prevent the measured boron concentration from falling below 1700 ppm due to normal sample variation.

The surveillance test for SIRWT boron concentration will be changed to require a minimum 1785 ppm. An engineering evaluation request has been submitted for determination of improved recirculation methods or systems for the SIRWT.

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TEXT (If more space is required, use additional NRC Form 366A's) (17)

At 0100 on October 17, 1984, it was determined during routine sample analysis that the boron concentration in the safety injection and refueling water tank (SIRWT) was 1668 ppm. This was contrary to Technical Specification 2.3(1)a which requires a boron concentration of at least 1700 ppm. The reactor was operating at approximately 100% power.

The control room was notified of the results of the boron analysis at 0120. Boration of the SIRWT was begun shortly thereafter. Fifteen hundred gallons of 6.74% boric acid were added to the SIRWT, increasing the boron concentration to 1997 ppm according to a sample drawn at 0315. After continued recirculation of the SIRWT, a sample drawn at 0500 yielded a boron concentration of 1867 ppm. Technical Specification 2.0.1(1) requires the plant to be placed in hot shutdown within six hours unless the boron concentration requirement is satisfied.

The most recent boron analysis prior to the one which yielded 1668 ppm had shown a SIRWT boron concentration of 1736 ppm. Water added to the SIRWT since the most recent analysis had been verified to be greater than 1900 ppm boron. The reduction in indicated boron concentration from 1736 ppm to 1668 ppm may have been due to normal analytical error or lack of homogeneity in the SIRWT boron concentration.

The accident for which SIRWT boron concentration plays the most important role is the main steam line break (MSLB) accident. The MSLB analysis for Cycle 9 (the present cycle) is enveloped by the analysis for Cycle 8. The positive reactivity insertion, due to cooldown to 210°F, is calculated to be 5.1% delta rho for Cycle 8 versus 2.8% delta rho for Cycle 9. The negative reactivity insertion with a SIRWT boron concentration of 1668 ppm would be (1700-1668 ppm) / (94 ppm/% delta rho) = .4% delta rho less than that assumed in the safety analysis.

However, the net effect is that a MSLB during Cycle 9, with a SIRWT boron concentration of 1668 ppm, would result in a positive reactivity addition of 5.1 - 2.8 - .4 = 1.9% delta rho less than that utilized in the Cycle 8 safety analysis.

In addition, it is emphasized that this event occurred early in core life at which time the consequences of a MSLB would be much less severe than late in core life.

The surveillance test for SIRWT boron concentration will be changed to require a minimum 1785 ppm. An engineering evaluation request has been submitted for determination of improved recirculation methods or systems for the SIRWT. The relationship, if any, of the recent and past occurrences will be assessed in the evaluation and appropriate action taken.

Other occurrences of the SIRWT having low boron concentration were reported in LER 76-23 and LER 84-12.

Omaha Public Power District
1623 Harney Omaha, Nebraska 68102
402/536-4000

November 16, 1984
FC-795-84
LIC-84-389

U.S. Nuclear Regulatory Commission
Document Control Desk
Washington, D.C. 20555

Reference: Docket No. 50-285

Gentlemen:

Licensee Event Report for the
Fort Calhoun Station

Please find attached Licensee Event Report 84-021 dated November 16, 1984. This report is being submitted per requirements of 10 CFR 50.73.

Sincerely,

R. L. Andrews
Division Manager
Nuclear Production

RLA/DJM/rh-W

Attachment

cc: Mr. Dorwin R. Hunter, Chief
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Fort Calhoun File (2)

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